A8/1725 IFW

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicant: Shinji YAMAMOTO

Title: EXHAUST GAS PURIFYING CATALYST

Appl. No.: 09/856,369

Filing Date: 05/21/2001

Examiner: C. Ildebrando

Art Unit: 1725

BRIEF ON APPEAL

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Under the provisions of 37 C.F.R. § 41.37, this Appeal Brief is being filed together with a check in the amount of $340.00 covering the Rule 41.20(b)(2) appeal fee. If this fee is deemed to be insufficient, authorization is hereby given to charge any deficiency (or credit any balance) to the undersigned deposit account 19-0741.

1. REAL PARTY IN INTEREST

The real party in interest is the assignee of record, Nissan Motor Co., Ltd

2. RELATED APPEALS AND INTERFERENCES

There are no related Appeals or Interferences.

3. STATUS OF CLAIMS

Claims 15 and 17-30 are pending. Claims 1-14 and 16 are cancelled. Claims 15 and 17-30 are rejected, and are the subject of this appeal.

4. STATUS OF AMENDMENTS

The present application is under a final rejection (See Final Rejection mailed March 29, 2004). Appeal of claims 15 and 17-30 is appropriate because all of the claims have been twice rejected. See 35 U.S.C. § 134(a). The Amendment after final rejection filed on June 29, 2004 (the "June 29 Amendment") is entered for the purposes of this Appeal (See Advisory Action mailed July 7, 2004).

A Claims Appendix lists the claims and their current status.

5. SUMMARY OF CLAIMED SUBJECT MATTER

The present invention relates to an exhaust gas purifying system for an internal combustion engine (claims 15 and 17-29), and a method that purifies exhaust gas (claim 30).

The invention of independent 15 is directed to an exhaust gas purifying system for an internal combustion engine (See engine 10 in FIG. 6). The exhaust gas purifying system includes an exhaust gas purifying catalyst (catalyst 1 in FIG. 6), and a device for controlling combustion in the engine (See electronic control unit (ECU) 13, fuel injection system 11, and oxygen sensor 12 in FIG. 6) to produce exhaust gas, to be brought in contact with a catalytic layer of the system. The exhaust gas has a very specific composition, namely a composition meeting the following relation: [(a concentration of hydrogen / a concentration of total reducing components) $\geq$ 0.3] (See specification, p. 10, lines 10-24). The exhaust gas purifying catalyst includes a monolithic substrate (See MONOLITHIC SUBSTRATE in FIGs. 2-5), a HC adsorbing layer (See HC ADSORBING LAYER in FIGs. 2-5) for adsorbing hydrocarbons (HC), where the HC adsorbing layer is formed on the monolithic substrate. The catalytic layer is formed on the HC adsorbing layer (See layer arrangement in FIGs. 2-5).

The catalytic layer (See HC REFORMING LAYER, CO REFORMING LAYER, AND HC PARTIAL OXIDATION LAYER in FIGs. 2 and 4, HC REFORMING LAYER and CO REFORMING LAYER in FIG. 3, and HC REFORMING LAYER, CO REFORMING LAYER, and NOx REDUCING LAYER in FIG. 5) is for producing hydrogen (H_2) and reducing NOx, where the catalytic layer functions to produce hydrogen (H_2) from at least one

of hydrocarbons and carbon monoxide (CO) and to reduce nitrogen oxides (NOx) with the produced hydrogen and at least one of hydrocarbons and carbon monoxide in exhaust gas (See specification, p. 5, lines 23-28).

The exhaust gas purifying system with the device for controlling combustion as specifically recited in claim 15 provides significant advantages by controlling combustion in the engine to produce exhaust gas having the recited composition to be brought into contact with the catalytic layer. When the combustion is controlled to produce an exhaust gas composition that meets the relation as recited in claim 15, the concentration of H_2 in the exhaust gas rises, thereby providing even further NOx reducing performance (See specification, page 11, lines 12-15).

Independent claim 30 is directed to a method which purifies exhaust gas. The method comprises providing an exhaust gas purifying catalyst (catalyst 1 in FIG. 6), and supplying exhaust gas to contact the catalytic layer. In this method, the exhaust gas has the same composition as recited in claim 15, namely a composition meeting a relation [(a concentration of hydrogen / a concentration of total reducing components) ≥ 0.3] (See specification, p. 10, lines 13-17). The exhaust gas purifying catalyst comprises a monolithic substrate (See MONOLITHIC SUBSTRATE in FIGs. 2-5), a HC adsorbing layer (See HC ADSORBING LAYER in FIGs. 2-5) for adsorbing hydrocarbons (HC), the HC adsorbing layer containing zeolite and being formed on the monolithic substrate, and a catalytic layer formed on the HC adsorbing layer (See layer arrangement in FIGs. 2-5). The catalytic layer (See HC REFORMING LAYER, CO REFORMING LAYER, AND HC PARTIAL OXIDATION LAYER in FIGs. 2 and 4, HC REFORMING LAYER and CO REFORMING LAYER in FIG. 3, and HC REFORMING LAYER, CO REFORMING LAYER, and NOx REDUCING LAYER in FIG. 5) is for producing hydrogen (H_2) and reducing NOx, where the catalytic layer functions to produce hydrogen (H_2) from at least one of hydrocarbons and carbon monoxide (CO) and to reduce nitrogen oxides (NOx) with the produced hydrogen and at least one of hydrocarbons and carbon monoxide in exhaust gas (See specification, p. 5, lines 23-28).

The invention of independent claim 30 provides advantages analogous to the advantages for claim 15. Namely, when the exhaust gas having the composition that meets the relation as recited in claim 30 is supplied to contact the catalytic layer, the concentration of H_2 in the exhaust gas rises thereby providing even further NOx reducing performance (See specification, page 11, lines 12-15).

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The grounds of rejection to be reviewed on appeal are:

A. the rejection of claims 15, 17-19 and 21-30 under 35 U.S.C. § 102(b) as being anticipated by EP 0782880 to Noda et al. (hereafter "Noda");

B. the rejection of claims 15, 17 and 30 under 35 U.S.C. § 102(b) as being anticipated by EP 0852966 to Ikeda et al. (hereafter "Ikeda");

C. the rejection of claim 20 under 35 U.S.C. § 103(a) as being unpatentable over Noda in view of U.S. Patent No. 5,164,350 to Abe et al. (hereafter "Abe"); and

D. the rejection of claims 23-25 under 35 U.S.C. § 103(a) as being unpatentable over Ikeda in view of Noda.

7. ARGUMENT

A. The rejection of claims 15, 17-19 and 21-30 under 35 U.S.C. § 102(b) as being anticipated by Noda

Claims 15, 17-19 and 21-29, of which claim 15 is independent

Noda does not disclose or suggest as recited in claim 15 "a device for controlling combustion in the engine to produce exhaust gas, to be brought into contact with said

catalytic layer, having a composition meeting a relation [(a concentration of hydrogen / a concentration of total reducing components) ≥ 0.3]", or the advantages attendant thereto.

As an initial matter, appellant submits that this limitation in the system of claim 15 represents a direct structural feature of the device for controlling combustion, which feature must be given patentable weight. This is not a recitation of capability of what the device for controlling combustion may be able to do (as may possibly be indicated by the comments of the PTO in the Final Office Action, on page 3, third full paragraph, with respect to Noda, and on page 8, second paragraph generally), but rather a structural limitation of the device for controlling combustion in an engine. This structural feature cannot be ignored in assessing patentability, i.e., the recited formula is an integral part of the recited control device.

With respect to Noda and claim 15, the Final Office Action states at page 4 "With regards to claim 15, Table 2 (page 10) details an engine which generates an exhaust gas which meets the claimed hydrogen/reducing components ratio." Noda, however, does not disclose a device for controlling combustion that produces exhaust gas with the particular relation of H_2 and the total reducing components of the exhaust gas as recited in claim 15. In Table 2, Noda discloses a composition of synthetic exhaust gas which is used in an experiment (see Noda, p. 10, lines 12-14, Table II). This is not a disclosure of a device for controlling combustion producing a particular exhaust gas. Moreover, the composition of the synthetic exhaust gas is not one that is controlled to be supplied to a catalyst in its regular use, i.e., Noda does not disclose the recited device for controlling, and in this sense Noda does not disclose the invention as recited in claim 15.

Moreover, even if the composition of the synthetic exhaust gas of Noda were to be the composition of exhaust gas to be supplied to the catalyst in regular operation, **the synthetic composition does not meet the relation recited in claim 15**. Specifically, the synthetic composition does not have a relation [(a concentration of hydrogen / a concentration of total reducing components) ≥ 0.3], as explained below.

Using the values of the concentrations of hydrogen and total reducing components disclosed in Noda in Table II, the ratio (concentration of hydrogen) / (a concentration of total

reducing components) can be readily calculated. The ratio becomes (where the total reducing components are CO, H_2 and HC) for Noda:

$.2 / (0.7 + 0.2 + 0.28) = 0.2 / 1.18 = 0.17$ (when $\lambda = 1.0$),

$.2 / (0.5 + 0.2 + 0.22) = 0.2 / 0.92 = 0.22$ (when $\lambda = 1.3$), and

$.33 / (2.0 + 0.33 + 0.45) = 0.33 / 2.78 = 0.12$ (when $\lambda = 0.96$).

Thus, Noda discloses (a concentration of hydrogen / a concentration of total reducing components) < 0.3 in all cases for the exhaust gas in Table II, which the PTO alleges as meeting the recited hydrogen/reducing component ratio.

On page 8, the Final Office Action states that, for claim 15 (and 17-29), the device for controlling combustion in the engine to produce exhaust gas is met by the references (Noda and Ikeda). Appellant respectfully disagrees. As outlined above, claim 15 specifically requires a device for controlling combustion in the engine to produce exhaust gas, to be brought into contact with the catalytic layer, where the exhaust gas has a very specific relation, namely, [(a concentration of hydrogen / a concentration of total reducing components) ≥ 0.3]. Even if Noda were to suggest controlling combustion, Noda does not disclose controlling combustion so as to produce exhaust gas with the relation as recited in claim 15, nor is this relation inherent[1]. Moreover, as discussed above, the particular relation disclosed in the Table II of Noda cited by the PTO does not fall within the relation recited in claim 15.

Claims 17-29 ultimately depend from claim 15, and are patentable over Noda for at least the same reasons.

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[1] The mere fact that an exhaust gas composition that may fall within the claimed relationship might happen to be accidentally or randomly produced during the operation of an engine is not sufficient to anticipate the claim language calling for a control device. If the PTO is relying on the doctrine of "inherent anticipation," appellant should be advised, and the PTO should explain how the legal requirements for an inherent anticipation are satisfied in this instance.

Claim 30

Independent claim 30 is directed to a method that includes the specific step of "supplying exhaust gas to contact said catalytic layer, the exhaust gas having a composition meeting a relation [(a concentration of hydrogen / a concentration of total reducing components) ≥ 0.3]." There is no showing that Noda supplies exhaust gas with the recited composition of claim 30, for reasons analogous to those for claim 15, discussed above. Thus, claim 30 is likewise patentable over Noda.

The Office Action on page 8 states with respect to claim 30:

> [a]pplicant's calculations are noted. However, as discussed above, the exact ratio is not considered to limit the catalyst as claimed. Also the calculations do not appear to be correct. The number in the ratios are inconsistent. The ratio for λ=1.3 appears as though it should be equal to 0.3.

This argument fails for at least two reasons: (1) claim 30 is a method claim, not a catalyst, and (2), the PTO's calculations for the ratio are incorrect. With respect to the ratio as recited in claim 30, appellant notes that claim 30 is a method claim, not a claim directed to a catalyst. Thus, the ratio in the step of "supplying exhaust gas to contact said catalytic layer, the exhaust gas having a composition meeting a relation [(a concentration of hydrogen / a concentration of total reducing components) ≥ 0.3]" is a clearly recited method step of claim 30, and must be considered.

With respect to the calculations, the ratio for λ=1.3 based on the parameters from Noda is clearly 0.22 as readily shown in the calculation above, not 0.3 as suggested by the PTO.

Non-obviousness of Claims 15 and 30

Moreover, Noda, failing to disclose or suggest the device for controlling combustion as specifically recited in claim 15, or the supplying exhaust gas with the recited composition of claim 30, also fails to suggest the significant advantages resulting therefrom. These

advantages are provided by a device that controls combustion in the engine to produce exhaust gas to be brought into contact with the catalytic layer where the exhaust gas composition meets the recited relation [(a concentration of hydrogen / a concentration of total reducing components) ≥ 0.3]. As disclosed in the specification, when the combustion is controlled to produce an exhaust gas composition that meets the relation as recited in claim 15, the concentration of H_2 in the exhaust gas rises thereby providing even further NOx reducing performance (see the present specification, page 11, lines 12-15). By contrast, in conventional techniques, any control of combustion creates exhaust gas having a relation [(a concentration of hydrogen / a concentration of total reducing components) < 0.3]. Consequently, the rate or concentration of H_2 in the exhaust gas is considerably smaller in the conventional techniques so that it is impossible to effectively use H_2 as a reducing component or agent (see the present specification, page 11, lines 15-21). Noda, failing to disclose or suggest having a device that controls combustion to provide an exhaust gas having the characteristics recited in claim 15, or the supplying exhaust gas with the recited composition of claim 30, fails to suggest the resulting significant advantages in further NOx reducing performance.

Thus, independent claims 15 and 30 are not anticipated by Noda and are furthermore believed to also be unobvious over the teachings of Noda. Reversal of this ground of rejection is respectfully solicited.

B. The rejection of claims 15, 17 and 30 under 35 U.S.C. § 102(b) as being anticipated by Ikeda

Claims 15 and 17, of which claim 15 is independent

Ikeda also does not disclose or suggest "a device for controlling combustion in the engine to produce exhaust gas, to be brought into contact with said catalytic layer, having a composition meeting a relation [(a concentration of hydrogen / a concentration of total reducing components) ≥ 0.3]" as recited in claim 15, or the advantages attendant thereto.

Again, appellant submits that this limitation in the system of claim 15 represents a direct structural feature of the device for controlling combustion, which feature must be given

patentable weight, including the recited relationship. This is not a recitation of capability of what the device for controlling combustion may be able to do, but rather a structural limitation of the device for controlling combustion in an engine. This structural feature cannot be ignored in assessing patentability.

With respect to Ikeda, the Final Office Action states at page 5 "With regard to claim 15, it is the position of the examiner that the claim requires a device which is capable of controlling the composition of exhaust gas which is met by the reference at page 8, lines 35-55." Ikeda, however, does not disclose a device for controlling combustion that produces exhaust gas with the particular relation of H_2 and the total reducing components of the exhaust gas as recited in claim 15. The section of Ikeda cited by the PTO does not disclose controlling combustion to produced an exhaust gas with the recited ratio of claim 15, nor is such control inherent[2] in the Ikeda device. Quite apparently, the PTO has refused to consider the recited relationship in assessing the claimed control device.

On page 8, the Final Office Action states that, for claim 15, the device for controlling combustion in the engine to produce exhaust gas is met by the references (Noda and Ikeda). Appellant respectfully disagrees. As outlined above, claim 15 specifically requires a device for controlling combustion in the engine to produce exhaust gas, to be brought into contact with the catalytic layer, where the exhaust gas has a very specific relation, namely, [(a concentration of hydrogen / a concentration of total reducing components) $\geq$ 0.3]. Even if Ikeda were to suggest controlling combustion, Ikeda does not disclose controlling combustion so as to produce exhaust gas with the relation as recited in claim 15, nor is this relationship inherent.

Claim 17 depends from claim 15, and is patentable over Ikeda for at least the same reasons.

Claim 30

[2] See comments in footnote 1, supra.

Independent claim 30 is directed to a method that includes the specific step of "supplying exhaust gas to contact said catalytic layer, the exhaust gas having a composition meeting a relation [(a concentration of hydrogen / a concentration of total reducing components) ≥ 0.3]." There is no showing that Ikeda supplies exhaust gas with the recited composition of claim 30, for reasons analogous to those for claim 15, discussed above. Moreover, as discussed above in connection with the rejection of claim 30 over Noda, it is entirely inappropriate to ignore an allegedly "functional" or "intended use" recitation in a method claim, which is expressly directed to the function or use. Thus, claim 30 is likewise not anticipated by Ikeda.

C. The rejection of claim 20 under 35 U.S.C. § 103(a) as being unpatentable over Noda in view of Abe

Claim 20

Claim 20 is a dependent claim depending ultimately from claim 15.

As discussed in detail above, Noda fails to disclose or suggest as recited in claim 15 "a device for controlling combustion in the engine to produce exhaust gas, to be brought into contact with said catalytic layer, having a composition meeting a relation [(a concentration of hydrogen / a concentration of total reducing components) ≥ 0.3]", or the advantages attendant thereto. Abe fails to cure the deficiencies of Noda insofar as Abe also fails to disclose or suggest this recited feature of claim 15. Thus, even if Noda were combined with Abe, the resultant device would not meet the limitations of claim 15.

Furthermore, since this rejection is based on § 103 for alleged "obviousness," the fact that Noda is completely devoid of any positive teaching with regard to the claimed control device (with its defined exhaust gas output relationship) dictates that the PTO must clearly differentiate its treatment of claim 20 from its parent claims that were rejected as anticipated, possibly based on some theory of "inherency." All factors must be considered, including the unobvious advantages discussed above in relation to the rejection over Noda. Moreover, the PTO cannot rely on any allegedly "inherent" disclosure of the references to support an

obvioiusness rejection, which, on the contrary, requires clear "teachings" of the claimed invention.

Claim 20 ultimately depends from claim 15, and is patentable over Noda and Abe for at least the same reasons that claim 15 is patentable.

Appellant respectfully requests the reversal of the rejection of claim 20.

D. The rejection of claims 23-25 under 35 U.S.C. § 103(a) as being unpatentable over Ikeda in view of Noda

Claims 23-25

Claims 23-25 all depend directly upon claim 15.

As discussed in detail above, neither Noda nor Ikeda disclose or suggest as recited in claim 15 "a device for controlling combustion in the engine to produce exhaust gas, to be brought into contact with said catalytic layer, having a composition meeting a relation [(a concentration of hydrogen / a concentration of total reducing components) $\geq$ 0.3]", or the advantages attendant thereto. Thus, even if Noda were combined with Ikeda, the resultant device would not meet the limitations of claim 15.

See the comments in the previous section, pointing out that the PTO, in making a proper § 103 obvioiusness determination, can only rely on clear teachings in the prior art, cannot properly rely on allegedly "inherent" subject matter in the prior art, and must consider unobvious advantages of the claimed invention. Appellant submits that the PTO has not correctly made the obviousness determination, for reasons explained above.

Claims 23-25 depend from claim 15, and are patentable over Noda and Ikeda for at least the same reasons that claim 15 is patentable over both of those references.

Reconsideration and reversal of the rejection of claims 23-25 are therefore respectfully requested.

8. CONCLUSION

For the foregoing reasons, it is submitted that the PTO's rejections are erroneous, and reversal of the applied rejections is respectfully requested.

Respectfully submitted,

Date October 27, 2004 By _____

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CLAIMS APPENDIX

Presently Pending Claims

1-14. (Cancelled)

15. (Original) An exhaust gas purifying system for an internal combustion engine, comprising:

an exhaust gas purifying catalyst including

a monolithic substrate,

a HC adsorbing layer for adsorbing hydrocarbons (HC), said HC absorbing layer being formed on said monolithic substrate, and

a catalytic layer for producing hydrogen (H_2) and reducing NOx, said catalytic layer functioning to produce hydrogen (H_2) from at least one of hydrocarbons and carbon monoxide (CO) and to reduce nitrogen oxides (NOx) with the produced hydrogen and at least one of hydrocarbons and carbon monoxide in exhaust gas, said catalytic layer being formed on said HC adsorbing layer; and

a device for controlling combustion in the engine to produce exhaust gas, to be brought into contact with said catalytic layer, having a composition meeting a relation [(a concentration of hydrogen / a concentration of total reducing components) $\geq$ 0.3].

16. (Cancelled)

17. (Previously Presented) An exhaust gas purifying system for an internal combustion engine as claimed in Claim 15, wherein said exhaust gas purifying catalyst is for purifying exhaust gas discharged from an internal combustion engine, wherein said HC adsorbing layer contains zeolite and functions to adsorb hydrocarbons during a cold operation of the engine and to release adsorbed hydrocarbons during a warm-up operation of the engine, wherein said catalytic layer functions to produce hydrogen from hydrocarbons released from said HC adsorbing layer and from at least one of hydrocarbons and carbon monoxide discharged from the engine after the warm-up operation and to reduce NOx with produced hydrogen and at least hydrocarbons and carbon monoxide in exhaust gas.

18. (Previously Presented) An exhaust gas purifying system for an internal combustion engine as claimed in Claim 15, wherein said catalytic layer contains a H_2 producing catalyst component for functioning to produce hydrocarbons, and a NOx reducing catalyst component for functioning to reduce nitrogen oxides, said H_2 producing catalyst

component being disposed on said HC adsorbing layer and including a HC reforming catalyst component functioning to reform hydrocarbons so as to produce hydrogen and a CO reforming catalyst component functioning to make steam reforming of carbon monoxide, said HC reforming catalyst component containing cerium oxide carrying palladium, said CO reforming catalyst component containing zirconium oxide carrying rhodium.

19. (Previously Presented) An exhaust gas purifying system for an internal combustion engine as claimed in Claim 18, wherein said catalytic layer further includes an upstream layer formed at an upstream section of said exhaust gas purifying catalyst, said upstream section being located upstream of said HC reforming catalyst component and said CO reforming catalyst component relative to flow direction of exhaust gas, said upstream layer containing alumina carrying palladium.

20. (Previously Presented) An exhaust gas purifying system for an internal combustion engine as claimed in Claim 18, wherein said zirconium oxide carrying rhodium contains alkaline earth and has a composition represented by the following formula (A):

$[X]_aZr_bO_c$ ... (A)

where X is an alkaline earth metal selected from the group consisting of magnesium, calcium, strontium and barium; a and b are ratios of atoms of elements; and c is a number of oxygen atoms required for satisfying valences of X and Zr, in which a is within a range of from 0.01 to 0.5, b is within a range of from 0.5 to 0.99, and a+b = 1.0.

21. (Previously Presented) An exhaust gas purifying system for an internal combustion engine as claimed in Claim 19, wherein said NOx reducing catalyst component functioning to reduce nitrogen oxides is contained in at least one of said HC adsorbing layer, said HC reforming catalyst component, said CO reforming catalyst component and said upstream layer containing alumina carrying palladium.

22. (Previously Presented) An exhaust gas purifying system for an internal combustion engine as claimed in Claim 19, wherein said NOx reducing catalyst component functioning to reduce nitrogen oxides is contained in at least one of said HC adsorbing layer, said HC reforming catalyst component, said CO reforming catalyst component and said upstream layer containing alumina carrying palladium, said NOx reducing catalyst

component containing at least one selected from the group consisting of palladium, platinum, rhodium, alumina, alkali metal and alkaline earth metal.

23. (Previously Presented) An exhaust gas purifying system for an internal combustion engine as claimed in Claim 15, wherein said zeolite contains H-type β-zeolite having a Si/2Al ratio ranging from 10 to 500.

24. (Previously Presented) An exhaust gas purifying system for an internal combustion engine as claimed in Claim 15, wherein said zeolite contains H-type β-zeolite and at least one of MFI, Y-type zeolite, USY-type zeolite and mordenite.

25. (Previously Presented) An exhaust gas purifying system for an internal combustion engine as claimed in Claim 15, wherein said zeolite contains at least one selected from the group consisting of palladium, magnesium, calcium, strontium, barium, silver, yttrium, lanthanum, cerium, neodymium, phosphorus, boron and zirconium.

26. (Previously Presented) An exhaust gas purifying system for an internal combustion engine as claimed in Claim 19, wherein said NOx reducing catalyst component functioning to reduce nitrogen oxides is contained in at least one of said HC adsorbing layer, said HC reforming catalyst component, said CO reforming catalyst component and said upstream layer containing alumina carrying palladium, said NOx reducing catalyst component containing at least one selected from the group consisting of alkali metal and alkaline earth metal, said NOx reducing catalyst component containing at least one selected from the group consisting of potassium, cesium, magnesium, calcium and barium.

27. (Previously Presented) An exhaust gas purifying system for an internal combustion engine as claimed in Claim 18, wherein said HC reforming catalyst component and said CO reforming catalyst are mixed to form a single layer disposed on said monolithic substrate on said HC adsorbing layer.

28. (Previously Presented) An exhaust gas purifying system for an internal combustion engine as claimed in Claim 18, wherein said HC reforming catalyst component forms a first layer disposed on said monolithic substrate, and said CO reforming catalyst forms a second layer, said second layer being formed on said first layer.

29. (Previously Presented) An exhaust gas purifying system for an internal combustion engine as claimed in Claim 18, wherein said HC reforming catalyst component

forms a first layer disposed on said monolithic substrate, and said CO reforming catalyst component forms a second layer, said second layer being formed downstream of said first layer relative to flow direction of exhaust gas.

30. (Previously Presented) A method comprising:

providing an exhaust gas purifying catalyst, the exhaust gas purifying catalyst comprising:

a monolithic substrate;

a HC adsorbing layer for adsorbing hydrocarbons (HC), said HC absorbing layer containing zeolite and being formed on said monolithic substrate; and

a catalytic layer for producing hydrogen (H_2) and reducing NOx, said catalytic layer functioning to produce hydrogen (H_2) from at least one of hydrocarbons and carbon monoxide (CO) and to reduce nitrogen oxides (NOx) with the produced hydrogen and at least one of hydrocarbons and carbon monoxide in exhaust gas, said catalytic layer being formed on said HC adsorbing layer; and

supplying exhaust gas to contact said catalytic layer, the exhaust gas having a composition meeting a relation [(a concentration of hydrogen / a concentration of total reducing components) $\geq$ 0.3].